Notice of Allowability	Application No.	Applicant(s)	
	09/651,159	BENTZ, OLE	
	Examiner	Art Unit	
	Chat C. Do	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *04/25/2006*.

2. ☒ The allowed claim(s) is/are *4-5 and 9-12 now re-number as 1-6*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date attached herein.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☒ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *attached herein* .
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☒ Other *restriction/election*.

MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-3, 6-8, and 13-21, drawn to clamp detection in multiplication, classified in class 708, subclass 553.

   II. Claims 4-5 and 9-12, drawn to method of detecting overflow, classified in class 708, subclass 552.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions Group I and Group II are related as combination and subcombination.

Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the overflow detection in Group II does not require the clamp predictor based on the sum of counted leading zeros and ones. The subcombination has separate utility such as Group I discloses a detail structure of clamp detection whereas Group II discloses general method of detecting overflow in multiplication operation.

The examiner has required restriction between combination and subcombination inventions. Where applicant elects a subcombination, and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104.

See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

3. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mr. Johnathan M. Fritz, Registration No. 52,922, on November 13, 2006 a provisional election was made without traverse to prosecute the invention of Group II, claims 4-5 and 9-12. Claims 1-3, 6-8, and 13-21 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. In order to expedite the prosecution, the applicant has agreed to cancel Group I, claims 1-3, 6-8, and 13-21, the non-elected claims.

EXAMINER'S AMENDMENT

6. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

7. The drawings were received on 08/30/2000 and 04/25/2006. These drawings are approved.

8. Authorization for this examiner's amendment was given in a telephone interview with Mr. Johnathan M. Fritz, Registration No. 52,922, on November 13, 2006.

9. The claims had been amended as follows:

Cancel claims 1-3, 6-8, and 13-21.

Claim 4. (amended) A method of clamping fixed-point multipliers, comprising:

providing a first and second input operand;

determining a desired number of output bits;

where any of the first and second input operands are positive, counting a number of leading logical zeros in the positive operands;

where any of the first and second input operands are negative, counting a number of leading logical ones in the negative operands;

summing the number of leading logical zeros of the positive operands with the number of leading logical ones in the negative operands;

determining a clamping decision based on the summing to yield a simple clamp predictor representative of the clamping decision;

computing a product of the first operand and the second operand such that the product has the desired number of output bits plus one additional bit; and

logically ORing the simple clamp predictor with a most significant bit of the product to produce a final clamping predictor bit wherein the product and determining steps occur substantially in parallel to avoid overflow.

Claim 9. (amended) A method of clamp detection using fixed-point multipliers, comprising:

inputting a first and a second operand to both a multiplier and an overflow detection circuit;

multiplying the first and second operands to generate a result not to exceed a pre-determined number of bits;

determining an initial clamping predictor bit based upon the first operand and the second operand; and

logically ORing the initial clamping predictor bit and a most significant bit of the result to produce a final clamping predictor bit to avoid overflow,

wherein the multiplying and determining occur independently and substantially in parallel,

wherein the most significant bit of the result is logically inverted prior to the logically ORing.

Claim 10. (amended) A method of clamp detection using fixed-point multipliers, comprising:

inputting a first and a second operand to both a multiplier and an overflow detection circuit;

multiplying the first and second operands to generate a result not to exceed a pre-determined number of bits;

determining an initial clamping predictor bit based upon the first operand and the second operand; and

logically ORing the initial clamping predictor bit and a most significant bit of the result to produce a final clamping predictor bit to avoid overflow;

wherein the multiplying and determining steps occur independently and substantially in parallel;

wherein the first and second operands are in a fixed-point format; and

wherein determining the initial clamping predictor bit includes determining a number of logical zeros in each of the operands and summing the number of logical zeros

to determine whether the sum exceeds a pre-determined number to determine the initial clamping predictor bit.

Claim 11. (amended) A method of clamp detection using fixed-point multipliers, comprising:

inputting a first and a second operand to both a multiplier and an overflow detection circuit;

multiplying the first and second operands to generate a result not to exceed a pre-determined number of bits;

determining an initial clamping predictor bit based upon the first operand and the second operand; and

logically ORing the initial clamping predictor bit and a most significant bit of the result to produce a final clamping predictor bit to avoid overflow;

wherein the multiplying and determining steps occur independently and substantially in parallel;

wherein the first and second operands are in a fixed-point format; and

wherein determining the initial clamping predictor bit includes determining a number of logical ones in each of the operands and summing the number of logical ones to determine whether the sum exceeds a pre-determined number.

Claim 12. (amended) A method of clamp detection using fixed-point multipliers, comprising:

inputting a first and a second operand to both a multiplier and an overflow detection circuit;

multiplying the first and second operands to generate a result not to exceed a pre-determined number of bits;

determining an initial clamping predictor bit based upon the first operand and the second operand; and

logically ORing the initial clamping predictor bit and a most significant bit of the result to produce a final clamping predictor bit to avoid overflow;

wherein the multiplying and determining steps occur independently and substantially in parallel;

wherein the first and second operands are in a fixed-point format; and

wherein determining the initial clamping predictor bit further comprises, when one of the operands is negative and one of the operands is positive, determining a number of logical ones for the negative operand and a number of logical zeros for the positive operand and summing the number of logical ones and the number of logical zeros to determine whether the sum exceeds or is equal to a pre-determined value for clamping to occur.

10. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on 7:00AM to 5:00PM M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C Do
Examiner
Art Unit 2193

November 12, 2006

MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100